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down-looking bone; *e. g.*, the lateral grooves of the distal end of the tibia. (4) When the inferior bones are the denser, the superior articular face yields; *e. g.*, the distal end of the radius to the first row of carpals (Fig. 11).

(5) The metapodial keels commence in the lower types on the posterior side of the distal extremity of the bone. This is partly due to the presence there of a pair of sesamoid bones, which with the tendons in which they are developed, sustain and press on the lateral parts of the extremities, and leave the middle line without support.

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EDITORS' TABLE.

EDITORS: A. S. PACKARD, JR., AND E. D. COPE.

— Morphological biology treats of the relations of solid bodies of organic origin. These solid bodies are often in the highest degree irregular in form, as for instance, the squamosal bone, or the liver, of vertebrated animals. The mental handling of such material requires faculties which belong to the artist and the mechanic, together with a capacity for generalization not essential to either of those classes of specialists. The mastery of any considerable number of organic forms requires the exercise of a thorough analysis of them, which of course presupposes good perceptive faculties. The latter form the important class which furnishes material to the reflective department of the mind, and without which the grandest powers of thought wander aimlessly in the search of truth, for want of fundamental facts.

While a definite idea of the forms of organic bodies is necessary to the biological thinker, the power of describing them is necessary to the biological writer. It is absolutely essential that the describer of structure and form shall use language which is not susceptible of several meanings, and that he shall know how to express contrasts when describing different objects. It is not uncommon to find divisions or groups of various grades defined in somewhat the following manner: Div. I. Legs long; bill curved; Div. II. Tail truncate; legs scaly. On reading this, the inexperienced student is impressed with the occult wisdom of the oracle, while the scientist, on the other hand, feels his fulminate one degree denser than before. Our experience leads us to sug-

gest that the faculty of analytical description sorely needs cultivation. It cannot be called a lost art until it shall have been found. Word painting is a high art, and the highest type of it is that which conveys to the mind of the reader a definite idea of the actual form of the object described. To accomplish this result ponderous nomenclatures have been created, and they are in a large degree necessary; but he displays the greater art who renders complex bodies as it were visible, by the use of the simple materials of ordinary language.

In view of the difficulties experienced by some in satisfying this necessity, much stress is laid, by many persons, on the importance of pictorial illustration. This we believe to be well, not only as a concession to the average of human capacity, but as greatly lightening the mental stress of the true scientist. Nevertheless there are three considerations in relation to this subject which have impressed us, and which we here venture to state:

(1) Pictures can never relieve an author of the necessity for good analytical description, because various points of an object cannot be shown by the number of representations which are within the reach of the average biologist. In the field of science the picture-maker may be a useful man, but he can never be a substitute for the analytical taxonomist.

(2) That pictures can never relieve the author from specifying the characters of his higher groups, as genera, families, etc., is self-evident.

(3) Iconography is only within reach of naturalists in proportion to their financial ability. Poverty should not condemn genius to inaction and obscurity.—C.

— We have received a circular from the committee on instruction of the Academy of Natural Sciences of Philadelphia, asking for subscriptions towards the expenses of the next winter's course of lectures, and for endowments of some or all of the lectureships provided for in the by-laws of the institution. We hope this request will be liberally responded to by citizens, so that we may add to our various educational agencies, a course like that of the Jardin des Plantes of Paris.

We wish here to recall the fact that an academy of sciences can only introduce teaching as a collateral activity, as its primary object is original research. The professorships in question were not created for teachers only, but as positions for original investigators of distinguished merit. Such men will be generally good lecturers also. Should the council of the Academy appoint to these positions any but its first original investigators, it will be in danger of losing its character as an Academy of Sciences and its very *raison d'être*. Every candidate for a lectureship should, therefore, be required to furnish a list of his papers descriptive of original discoveries he has made.

— We have received the following from a distinguished correspondent:

ALBANY, MAY 14, 1881.

Gentlemen:—I have received the notice extracted from AM. NATURALIST, in reference to an invitation to the British Association for the Advancement of Science to meet in America in 1883.

I approve of the invitation, which it will be necessary to repeat before its acceptance.

It is well to begin the invitation in order that we may approach the object which sooner or later I believe will be accomplished.

Very truly yours,

JAMES HALL.

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RECENT LITERATURE.

SEMPER'S ANIMAL LIFE AS AFFECTED BY THE NATURAL CONDITIONS OF EXISTENCE.¹—The author's aim in preparing the lectures which he originally delivered before the Lowell Institute, at Boston, and which are here presented to the reading public, is expressed in the following words, to be found in the preface: "It appears to me that of all the properties of the animal organism, variability is that which may first and most easily be traced by exact investigation to its efficient causes; and, as it is beyond a doubt the subject around which at the present moment the strife of opinions is most violent, it is that which will be most likely to repay the trouble of closer research." Professor Semper, therefore, endeavors, and we think with a good degree of success, to present a general view of those facts and hypotheses which bear upon the subject, and which are either of universal significance or, from his own point of view, appear to offer favorable subjects for experimental treatment. The work is not an attempt at a general argument for the evolution hypotheses. If it was, a great many more views and facts might have been presented, but the value of the book is that it is mainly an original contribution to the general subject of evolution from the point of view of experiments on the relations between animals and their environment, which may be largely made in the laboratory, as well as in the field. The subject of endeavoring to account for the *origin* of the variations of species, of seeking for the efficient causes of variability, is not unfamiliar to American naturalists. Darwin professedly starts from the tendency to variation, and his theory, as such, ignores or opposes any thing like Lamarckianism or the influence of the environment on the organism. A few American writers have felt that we must endeavor to seek the causes inducing the tendency to variation, and have thus been led to what we may call a modified, scientific form of Lamarckianism. In order that the organism may undergo change

¹*The International Scientific Series.* Animal Life as Affected by the Natural Conditions of Existence. By KARL SEMPER, Professor of the University of Würzburg. With two maps and 106 wood cuts. 12mo, pp. 472.